User's Manual

ETE-CN700

MSC ETX Module

- PRELIMINARY -

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MICROCOMPUTERS · SYSTEMS · COMPONENTS · VERTRIEBS GMBH

... embedding excellence

Preface

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1 General Information

1.1 Revision History

Rev.	Date	Description
0.1		Initial version
0.2, 0.3		New formatting
0.4	27-Feb-07	BIOS chapter integrated
0.5	16-Apr-07	Power consumption results added
	31-May-07	New Setup Node 'POST Errors'
0.6	21-August-07	Fan connector added, pictures updated (rev1 -> rev2)
0.7	05-October-07	Correction of Defaults in BIOS
0.8	20-March-08	Preface added
0.9	12-September-08	Update BIOS chapter

1.2 Introduction

The ETe-CN700 is an all-in-one cpu module. It is fully compliant with the ETX 3.0 standard.

The design of the MSC ETE-CN700 module supports the VIA Eden(V4) and VIA C7 processor combined with the CN700 and 8237R+ bridge components thus enabling new features like DDR memory support, Dual Display Support, USB 2.0 and onboard SATA according to the new ETX® Specification 3.0.

On board features include an 100MBit Ethernet controller , two EIDE ports, audio, parallel / floppy, serial, keyboard and mouse interfaces, four usb 2.0 ports.

Please visit our website http://www.msc-ge.com where you can find drivers, firmware updates and documentation (--> COM/Embedded Modules --> ET(e)/ETX® --> ETE-CN700).

2 Technical Information

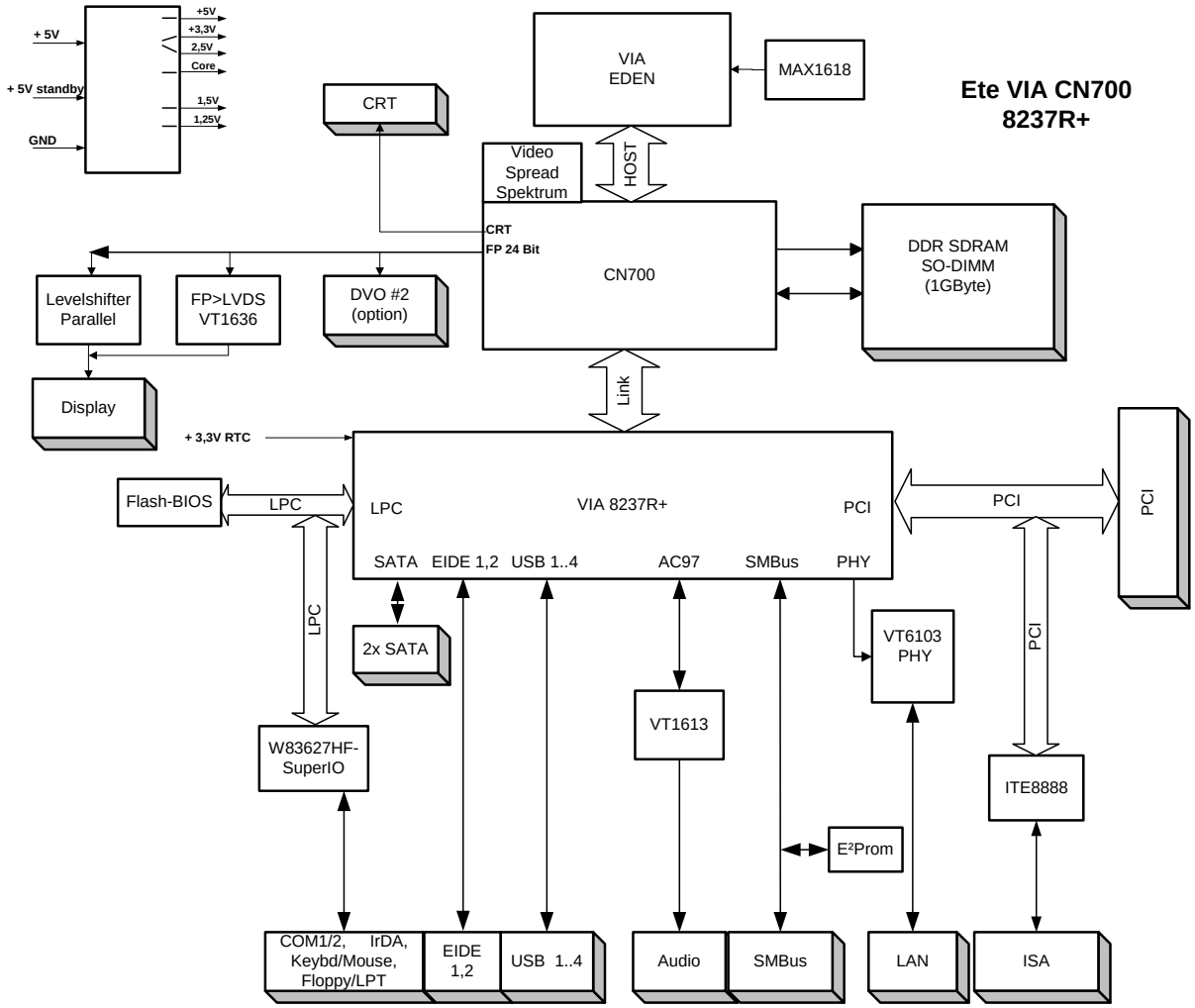
2.1 Specifications

Core

CPU	VIA Eden(V4) 400MHz - 1.2GHz, Eden ULV(V4), VIA C7 up to 1.8GHz, all versions soldered (with optional heatspreader)
ChipSet	VIA CN700 Nortbridge VIA VT8237R+ Southbridge
L2 Cache	128KB second level cache on chip
Memory	200-Pin SO-DIMM socket (max. 1GB DDR400 SDRAM)
ISA-Bus Interface	ITE8888 PCI to ISA Bridge (ETX connector X2)
PCI-Bus Interface	VIA VT8237R+ Southbridge; 4 external PCI bus masters (ETX connector X1)
Video	3D Unichrome ™ Pro controller (integrated in CN700 Chipset) up to 32MB Video Memory (UMA) dual video streams LVDS Interface: 24-bit, 2pixel/clock; max. resolution 1.600 x 1.200 TFT Interface: 18-bit (optional) , 3.3V CRT Interface: max. resolution 1.600 x 1.200
Ethernet	10/100Base-TX controller in VT8237R+ (PHY VT6103)
Audio	VT8237R+ AC97 Audio controller VT1613 AC97 Codec
USB	integrated in VT8237R+ South Bridge 4 USB 2.0 ports
EIDE	integrated in VT8237R+ South Bridge 2 Ports (primary, secondary) for up to 4 devices Ultra ATA/66/100/133; PIO Mode 4; PCI IDE Busmaster
Floppy Disk	integrated in W83627HF-AW SuperIO (pinsshared with parallel port)
Serial, COM1, COM2	integrated in W83627HF-AW SuperIO 2 x TTL IrDA on COM2
Parallel	integrated in W83627HF-AW SuperIO 1 Parallel Port (PS/2-compatible/ECP/EPP via SETUP

	configurable, pins shared with floppy port)
Keyboard, Mouse	MFII-Keyboard Interface, PS/2-Mouse Interface integrated in VT8237R+ South Bridge
Realtime Clock	integrated in VT8237R+ South Bridge, external battery required
Watchdog	PIC12C509A Start delay and timeout configurable via SETUP creates hardware reset
BIOS	Phoenix cME FirstBIOS Pro in 1024 KB Flash LPC Firmware Hub
EEPROM	EEPROM for CMOS Setup backup
System Monitoring	1 fan with speed input (valid only if optional fan connector is used) 2 temperatures (CPU by MAX1618, Board by W83627HF-AW SuperIO) 6 voltages (CPU core, +1.05,+1.50,+2.5V, +3.3V, + 5V)
Power supply	+5V ±5%
Typical supply current (DOS prompt)	VIA Eden 400Mhz 1.60 A (8.00 W) VIA Eden 1000Mhz 1.95 A (9.75 W) VIA Eden 1200Mhz 2.15 A (10.75 W) VIA C7 1500Mhz 2.90 A (14.50 W)
Typical CMOS battery power consumption	2.5µA at +3V RTC / CMOS integrated in VT8237R+ South Bridge
Environment	Temperature 0 ... + 60°C (operating), -25 ... + 85°C (non operating) Humidity (rel.) 0 … 95 % (operating), 5 … 95 % (non operating) Note: A heat spreader plate is available from MSC providing a standard thermal interface for the module. **The heat spreader is not a heat sink!** The heat spreader is thermally connected to the cpu and the VIA CN700 Nortbridge using a 3mm aluminium plate (for the cpu) and thermal gap pads. About 75% of the power dissipated by the module is conducted to the heat spreader. The thermal solution (passive or active) has to be designed for 8 W (400MHz) to about 19 W (1,5GHz).
Dimensions	95 x 114 x 12 mm

2.2 Block Diagram



2.3 Installation

2.3.1 Jumpers and switches

There are no jumpers or switches.

2.3.2 Installing a DRAM SO-DIMM module

The ETe-CN700 board has a standard SO-DIMM socket for 2.5V DDR SO-DIMM modules (max.1 Gbyte)

Note : Module height should not exceed 1250mil (= 31.75 mm)

2.4 Watchdog

The Ete-CN700 board has a watchdog function implemented using a PIC microcontroller with an SMBus interface. Via SETUP the watchdog can be enabled and configured.

If the watchdog is enabled a counter is started which creates a reset if it is not retriggered within a programmable time window.

Watchdog:	Enabled / Disabled (default)
Initial Delay :	1s, 5s, 10s, 30s (default), 1min, 5min, 10min, 30min
Timeout :	0,4s, 1s, 5s, 10s, 30s (default), 1min, 5 min, 10min
Start on Boot:	if yes, watchdog starts at the end of POST (power on self-test) before the OS is loaded

The watchdog is controlled by the software UEBI Interface.

2.5 Interrupts, DMA channels, Upper memory

IRQ	used for	available	comment
0	Timer 0	No	
1	Keyboard	No	
2	Slave 8259	No	
3	COM2	No	(1)
4	COM1	No	(1)
5	Audio / LPT2	Yes	(1) / (2) / (3)
6	Floppy Disk Controller	No	(1)
7	LPT1	No	(1)
8	Real Time Clock	No	
9	SCI IRQ (ACPI)	No	
10	PCI / COM3	Yes	(1) / (3)
11	PCI / COM4	Yes	(1) / (3)
12	PS/2 Mouse	No	(1)
13	Floating Point Unit	No	
14	Primary IDE	No	
15	Secondary IDE	No	

(1) If the device is disabled in SETUP, the interrupt is available

(2) Can be used by legacy audio (sound blaster)

(3) Can be used by external Super I/O controller FDC37C669

2.5.1 PCI Devices

PCI Device	PCI Interrupt	REQ/GNT (0..3)	IDSEL
PCI/ISA Bridge		4	AD25
SATA	INT E		
USB 0..3 (Southbridge)	INT F		
Sound AC 97	INT G		
LAN	INT H		

2.5.2 DMA channels

DMA	used for	available	comment
0		Yes	
1		(Yes)	Can be used by legacy audio (sound blaster)
2	Floppy Disk Controller	No	
3	(ECP, if enabled)	(No)	LPT ECP mode (default)
4	Cascade	No	
5..7	- - -	Yes	

2.5.3 Memory map

Upper Memory	used for	available	comment
C0000h..CFFFFh	VGA BIOS	No	64 KB VGA BIOS
D0000h..E3FFFh		Yes	ISA bus or shadow RAM
E4000h..FFFFFh	System BIOS	No	

2.5.4 SMBus address map

Device	A6	A5	A4	A3	A2	A1	A0	R/W	address *)
SMBus host	0	0	0	1	0	0	0	x	10h / 08h
core temperature (MAX1618)	0	1	0	1	0	1	0	x	54h / 2Ah
clock synthesizer (ICS952906)	1	1	0	1	0	0	1	x	D2h / 69h
Ram Clock (ICS9P936)	1	1	0	1	1	1	0	x	DCh / 6Eh
watchdog (PIC12C509)	1	0	1	1	0	0	0	x	B0h / 58h
CMOS backup EEPROM #1	1	0	1	0	1	0	0	x	A8h / 54h
CMOS backup EEPROM #2	1	0	1	0	1	0	1	x	AAh / 55h
SPD EEPROM (SO-DIMM)	1	0	1	0	0	0	0	x	A0h / 50h

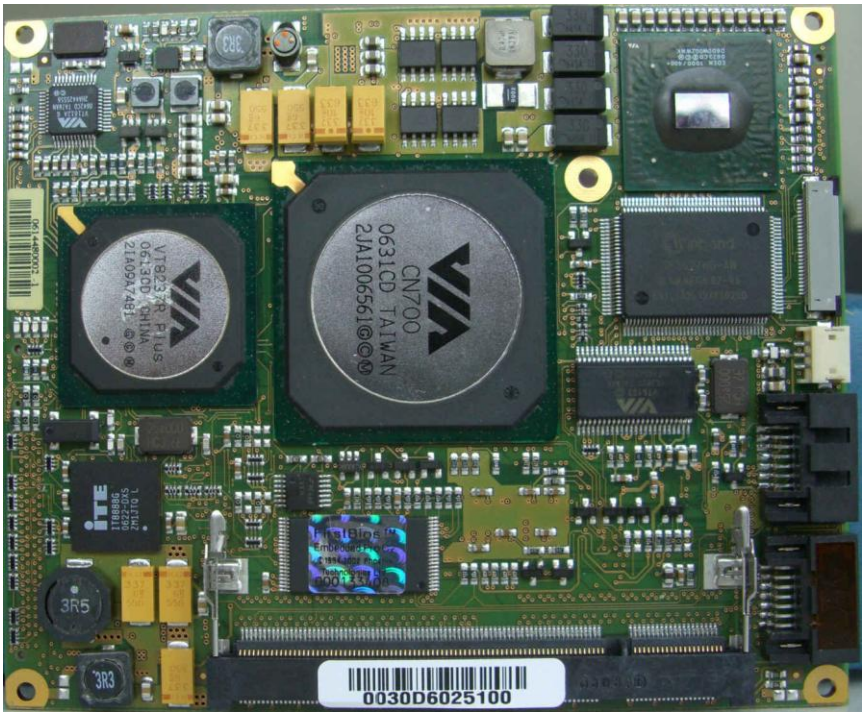
*) 8 bit address (with R/W) / 7 bit address (without R/W)

2.6 Mechanical Specification

2.6.1 Top view

X1

X3



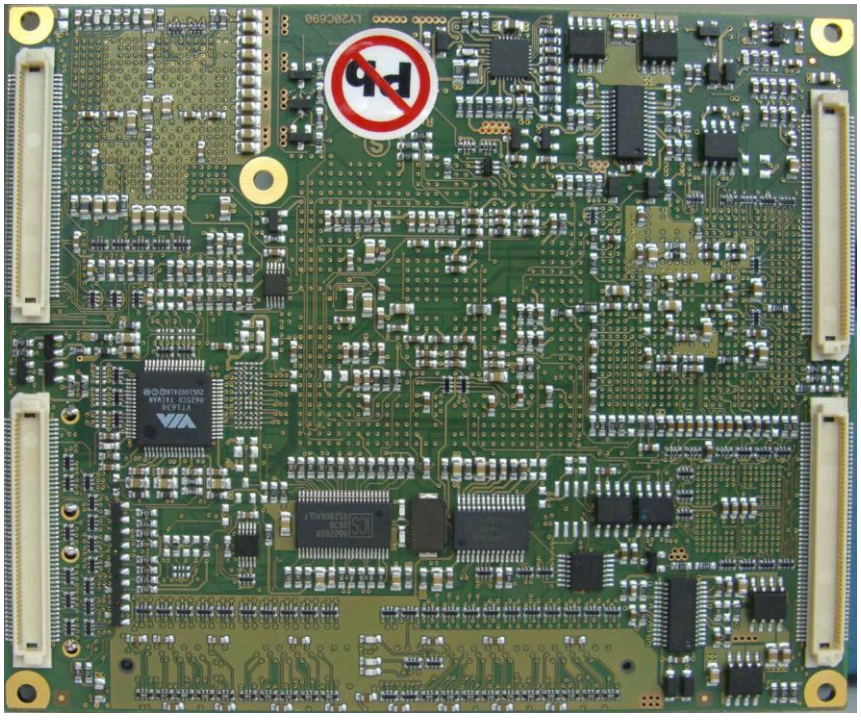
X2

X4

2.6.2 Bottom view

X3

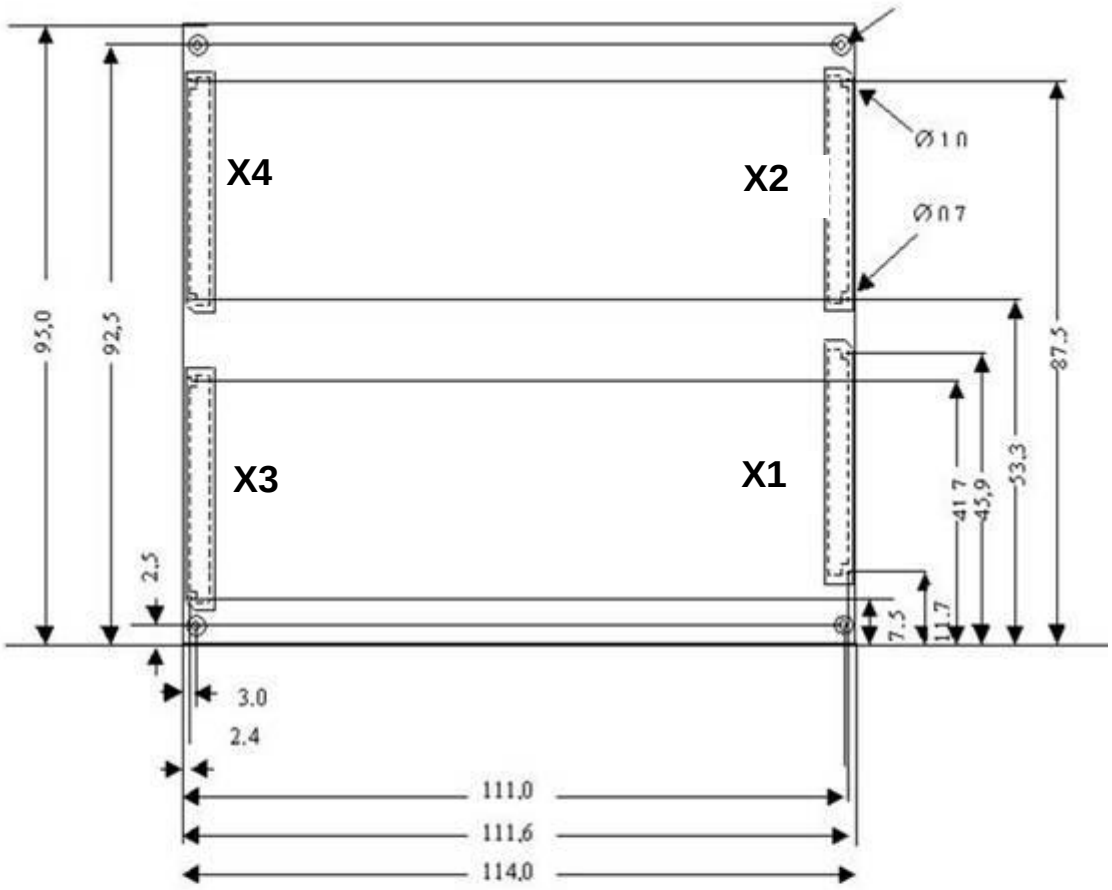
X1

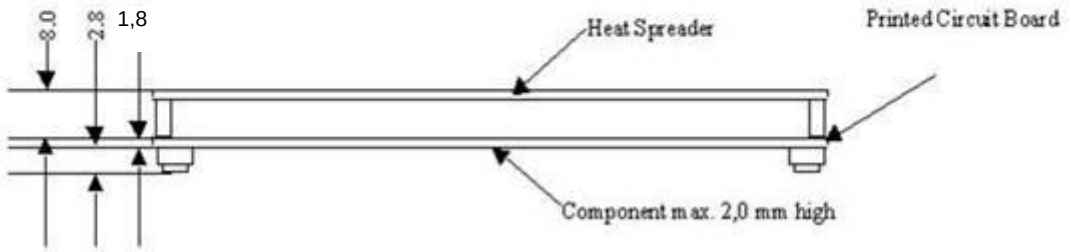


X4

X2

2.6.3 Mechanical drawing





2.6.4 Heat spreader options

- Heat spreader with through hole standoffs (3mm)
- Heat spreader with threaded corner standoffs (2,5mm)

3 ETX Connectors

3.1 Connector X1 (PCI, USB, Audio)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	GND	51	VCC	52	VCC
3	PCICLK3	4	PCICLK4	53	PAR	54	SERR#
5	GND	6	GND	55	GPERR#	56	RESERVED
7	PCICLK1	8	PCICLK2	57	PME#	58	USB2#
9	REQ3#	10	GNT3#	59	LOCK#	60	DEVSEL#
11	GNT2# (*)	12	3.3V	61	TRDY#	62	USB3#
13	REQ2# (*)	14	GNT1#	63	IRDY#	64	STOP#
15	REQ1#	16	3.3V	65	FRAME#	66	USB2
17	GNT0#	18	RESERVED	67	GND	68	GND
19	VCC	20	VCC	69	AD16	70	CBE2#
21	SERIRQ	22	REQ0#	71	AD17	72	USB3
23	AD0	24	3.3V	73	AD19	74	AD18
25	AD1	26	AD2	75	AD20	76	USB0#
27	AD4	28	AD3	77	AD22	78	AD21
29	AD6	30	AD5	79	AD23	80	USB1#
31	CBE0#	32	AD7	81	AD24	82	CBE3#
33	AD8	34	AD9	83	VCC	84	VCC
35	GND	36	GND	85	AD25	86	AD26
37	AD10	38	AUXAL	87	AD28	88	USB0
39	AD11	40	MIC	89	AD27	90	AD29
41	AD12	42	AUXAR	91	AD30	92	USB1
43	AD13	44	ASVCC	93	PCIRST#	94	AD31
45	AD14	46	SNDL	95	INTC#	96	INTD#
47	AD15	48	ASGND	97	INTA#	98	INTB#
49	CBE1#	50	SNDR	99	GND	100	GND

(*) REQ / GNT 2 used by onboard ethernet controller

Signal	Description	I/O	Note
VCC	Power Supply +5V, +/-5%	I	external supply
GND	Power Ground	I	external supply
3V	Power Supply +3.3V	O	Do not use externally
RESERVED	Not connected	n.a.	Do not connect
SERIRQ	Serial interrupt request	n.c.	Not supported

Signal	Description of PCI Bus Signals	I/O	Note
			PCI outputs 3,3V signal level PCI inputs 5V tolerant
PCICLK1..4.	PCI clock output	O	
REQ0..3#	PCI bus request	I	REQ2# used by onboard LAN controller 82551ER
GNT0..3#	PCI bus grant	O	GNT2# used by onboard LAN controller 82551ER
AD0..31	PCI Adress-/ Databus	I/O	
CBE0..3#	PCI bus command/byte enables	I/O	
PAR	PCI bus parity	I/O	
SERR#	PCI bus system error	I/O	
GPERR#	PCI bus grant parity error	I/O	
PME#	PCI bus power management event	I/O	Not supported
LOCK#	PCI bus lock	I/O	
DEVSEL#	PCI bus device select	I/O	
TRDY#	PCI bus target ready	I/O	
IRDY#	PCI bus initiator ready	I/O	
STOP#	PCI bus stop	I/O	
FRAME#	PCI bus frame	I/O	
PCIRST#	PCI bus reset	O	
INTA#	PCI bus interrupt A	I	
INTB#	PCI bus interrupt B	I	
INTC#	PCI bus interrupt C	I	
INTD#	PCI bus interrupt D	I	

Signal	Description of USB Signals	I/O	Note
USB0, USB0#	USB Port 0	I/O	
USB1, USB1#	USB Port 1	I/O	
USB2, USB2#	USB Port 2	I/O	
USB3, USB3#	USB Port 3	I/O	

Signal	Description of Audio Signals	I/O	Note
SNDL	Line-Level stereo output left	O	0.7VRMS
SNDR	Line-Level stereo output right	O	0.7VRMS
AUXAL	Auxiliary input A left	I	
AUXAR	Auxiliary input A right	I	
MIC	Microphone input	I	
ASGND	Analog ground of sound controller	I	
ASVCC	Analog supply of sound controller	O	3.3V

3.2 Connector X2 (ISA)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	GND	51	VCC	52	VCC
3	SD14	4	SD15	53	SA6	54	IRQ5
5	SD13	6	MASTER#	55	SA7	56	IRQ6
7	SD12	8	DREQ7	57	SA8	58	IRQ7
9	SD11	10	DACK7#	59	SA9	60	SYSCLK
11	SD10	12	DREQ6	61	SA10	62	REFSH#
13	SD9	14	DACK6#	63	SA11	64	DREQ1
15	SD8	16	DREQ5	65	SA12	66	DACK1#
17	MEMW#	18	DACK5#	67	GND	68	GND
19	MEMR#	20	DREQ0	69	SA13	70	DREQ3
21	LA17	22	DACK0#	71	SA14	72	DACK3#
23	LA18	24	IRQ14	73	SA15	74	IOR#
25	LA19	26	IRQ15	75	SA16	76	IOW#
27	LA20	28	IRQ12	77	SA18	78	SA17
29	LA21	30	IRQ11	79	SA19	80	SMEMR#
31	LA22	32	IRQ10	81	IOCHRDY	82	AEN
33	LA23	34	IO16#	83	VCC	84	VCC
35	GND	36	GND	85	SD0	86	SMEMW#
37	SBHE#	38	M16#	87	SD2	88	SD1
39	SA0	40	OSC	89	SD3	90	NOWS#
41	SA1	42	BALE	91	DREQ2	92	SD4
43	SA2	44	TC	93	SD5	94	IRQ9
45	SA3	46	DACK2#	95	SD6	96	SD7
47	SA4	48	IRQ3	97	IOCHK#	98	RSTDRV
49	SA5	50	IRQ4	99	GND	100	GND

Signal	Description	I/O	Note
VCC	Power Supply +5V, +/-5%	I	external supply
GND	Power Ground	I	external supply

Signal	ISA Bus Signals	I/O	Note
SD0..15	ISA Databus	I/ O	all ISA outputs 3,3V signal level all ISA inputs 5V tolerant
SA0..19	ISA Addressbus	O	
LA17..23	ISA Addressbus	O	
SBHE#	ISA Byte High Enable	O	
BALE	ISA Address Latch Enable	O	
AEN	ISA Address Enable	O	
MEMR#	ISA memory read	O	
SMEMR#	ISA memory read in lowest 1MB address range	O	
MEMW#	ISA memory write	O	
SMEMW#	ISA memory write in lowest 1MB address range	O	
IOR#	ISA IO read	O	
IOW#	ISA IO write	I	
IOCHK#	ISA IO check	I	
IOCHRDY	ISA IO channel ready	I	
M16#	ISA 16Bit memory device	I	
IO16#	ISA 16Bit IO device	O	
REFSH#	ISA memory refresh cycle pending	I	
NOWS#	ISA No waitstates	n.c.	Not supported
MASTER#	ISA Master	O	
SYSCLK	ISA System clock (8 MHz)	O	
OSC	ISA Oscillator (14,31818 MHz)	O	
RSTDRV	ISA Reset signal	I	
DREQ0..7	ISA DMA request	I	DRQ2 used by onboard floppy controller (see 2.5)
DACK0#..7#	ISA DMA acknowledge	O	DACK2# used by onboard floppy controller (see 2.5)
TC	ISA DMA end	I/O	
IRQ3..7	ISA Interrupt request	I	Interrupt table see 2.5
IRQ9..12	ISA Interrupt request	I	Interrupt table see 2.5
IRQ14..15	ISA Interrupt request	I	Interrupt table see 2.5

3.3 Connector X3 (CRT, Display, TVout, Serial, Parallel, Mouse, Keyboard)

Standard pinout with LVDS and LPT

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	GND	51	LPT/FLPY#	52	RESERVED
3	R	4	B	53	VCC	54	GND
5	HSY	6	G	55	STB#/RES	56	AFD#/DENSEL
7	VSY	8	DDCK	57	RESERVED	58	PD7/RES
9	DETECT#	10	DDDA	59	IRRX	60	ERR#/HDSEL#
11	LCDDO16	12	LCDDO18	61	IRTX	62	PD6/RES
13	LCDDO17	14	LCDDO19	63	RXD2	64	INIT#/DIR#
15	GND	16	GND	65	GND	66	GND
17	LCDDO13	18	LCDDO15	67	RTS2#	68	PD5/RES
19	LCDDO12	20	LCDDO14	69	DTR2#	70	SLIN#/STEP#
21	GND	22	GND	71	DCD2#	72	PD4/DSKCHG#
23	LCDDO8	24	LCDDO11	73	DSR2#	74	PD3/RDATA#
25	LCDDO9	26	LCDDO10	75	CTS2#	76	PD2/WP#
27	GND	28	GND	77	TXD2	78	PD1/TRK0#
29	LCDDO4	30	LCDDO7	79	RI2#	80	PD0/INDEX#
31	LCDDO5	32	LCDDO6	81	VCC	82	VCC
33	GND	34	GND	83	RXD1	84	ACK/DRV1
35	LCDDO1	36	LCDDO3	85	RTS1#	86	BUSY#/MOT1#
37	LCDDO0	38	LCDDO2	87	DTR1#	88	PE/WDATA#
39	VCC	40	VCC	89	DCD1#	90	SLCT#/WGATE#
41	JILI_DAT	42	LTGIO0	91	DSR1#	92	MSCLK
43	JILI_CLK	44	BLON#	93	CTS1#	94	MSDAT
45	BIASON	46	DIGON	95	TXD1	96	KBCLK
47	COMP	48	Y	97	RI1#	98	KBDAT
49	SYNC	50	C	99	GND	100	GND

Signal	Description	I/O	Note
VCC	Power Supply +5VDC, 5%	I	external supply
GND	Power Ground	I	external supply
N.C.	Not connected	n.a.	Do not connect
LTGIO0	General Purpose IO	O	Used for parallel display option (VSYNC)

Signal	Description of analog CRT signals	I/O	Note
HSYNC	Horizontal Sync	O	
VSYNC	Vertical Sync	O	
R	Red channel RGB Analog Video Output	O	
G	Green channel RGB Analog Video Output	O	
B	Blue channel RGB Analog Video Output	O	
DDCK	Display Data Channel Clock	I/O	
DDDA	Display Data Channel Data	I/O	

Signal	Description of COMx signals	I/O	Note
DTR1..2#	Data terminal ready of COM1/COM2	I	
RI1..2#	Ring indicator of COM1/COM2	I	
TXD1..2	Data transmit of COM1/COM2	O	
RXD1..2	Data receive of COM1/COM2	I	
CTS1..2#	Clear to send of COM1/COM2	I	
RTS1..2#	Request to send of COM1/COM2	O	
DCD1..2#	Data carrier detect of COM1/COM2	O	
DSR1..2#	Data set ready of COM1/COM2	I	

Signal	Description of keyboard and infrared signals	I/O	Note
KBDAT	Keyboard Data	I/O	
KBCLK	Keyboard Clock	O	
MSDAT	Mouse Data	I/O	
MSCLK	Mouse Clock	O	
IRTX	Infrared Transmit	O	
IRRX	Infrared Receive	I	

Signal	Description of FDC signals (shared with LPT)	I/O	Note
LPT/FLPY#	LPT or Floppy Interface configuration input	I	Connect to GND
STB#/RES	nc	-	
AFD#/DENSEL	density select: low = 250/300Kb/s high = 500/1000Kb/s	O	
PD0/INDEX#	Index signal	I	
PD1/TRK0#	Track signal	I	
PD2/WP#	Write protect signal	I	
PD3/RDATA#	Raw data read	I	
PD4/DSKCHG#	Disc changed	I	
PD5/RES	nc	-	
PD6/RES	nc	-	
PD7/RES	nc	-	
ERR#/HDSEL#	Head select	O	
INIT#/DIR#	Direction	O	
SLIN#/STEP#	Motor step	O	
ACK/DRV1	Drive 1 select	O	
BUSY#/MOT1#	Motor 1 select	O	
PE/WDATA#	Raw write data	O	
SLCT#/WGATE#	Write enable	O	

Signal	Description of LPT signals (shared with FDC)	I/O	Note
LPT/FLPY#	LPT or Floppy Interface configuration input	I	Connect to VCC (resistor 4K7)
STB#/RES	Strobe signal	O	
AFD#/DENSEL	Automatic feed	O	
PD0/INDEX#	Databus D0	I/O	
PD1/TRK0#	Databus D1	I/O	
PD2/WP#	Databus D2	I/O	
PD3/RDATA#	Databus D3	I/O	
PD4/DSKCHG#	Databus D4	I/O	
PD5/RES	Databus D5	I/O	
PD6/RES	Databus D6	I/O	
PD7/RES	Databus D7	I/O	
ERR#/HDSEL#	LPT error	I	
INIT#/DIR#	Initiate	O	
SLIN#/STEP#	Select	O	
ACK/DRV1	Acknowledge	I	
BUSY#/MOT1#	Busy	I	
PE/WDATA#	Paper empty	I	
SLCT#/WGATE#	Power ON	I	

Signal	Description of LVDS Flatpanel signals	I/O	Note
DIGON	Display Power ON	O	
BLON#	Display Backlight ON	O	
LCDDO0	Y0-	O	
LCDDO1	Y0+	O	
LCDDO2	Y1-	O	
LCDDO3	Y1+	O	
LCDDO4	Y2-	O	
LCDDO5	Y2+	O	
LCDDO6	YCLK-	O	
LCDDO7	YCLK+	O	
LCDDO8	Y3-	O	
LCDDO9	Y3+	O	
LCDDO10	Z0-	O	
LCDDO11	Z0+	O	
LCDDO12	Z1-	O	
LCDDO13	Z1+	O	
LCDDO14	Z2-	O	
LCDDO15	Z2+	O	
LCDDO16	ZCLK-	O	
LCDDO17	ZCLK+	O	
LCDDO18	Z3-	O	
LCDDO19	Z3+	O	

Signal	Description of TTL Flatpanel signals	I/O	Note
DIGON	Display Power ON	O	
BLON#	Display Backlight ON	O	
LCDDO0	R0	O	FPD2
LCDDO1	R1	O	FPD3
LCDDO2	R2	O	FPD4
LCDDO3	R3	O	FPD5
LCDDO4	R4	O	FPD6
LCDDO5	R5	O	FPD7
LCDDO6	G0	O	FPD10
LCDDO7	G1	O	FPD11
LCDDO8	G2	O	FPD12
LCDDO9	G3	O	FPD13
LCDDO10	G4	O	FPD14
LCDDO11	G5	O	FPD15
LCDDO12	B0	O	FPD18
LCDDO13	B1	O	FPD19
LCDDO14	B2	O	FPD20
LCDDO15	B3	O	FPD21
LCDDO16	B4	O	FPD22
LCDDO17	B5	O	FPD23

			LVDS mode pin description
SHFCLK	Shift Clock	O	LCDDO18
EN	Display Enable	O	LCDDO19
HSYNC	Horizontal Sync	O	BIASON
VSYNC	Vertical Sync	O	LTGIO0

Note: Displays with 2 pixels/clock are not supported in parallel mode

3.4 Connector X3 - alternate pinout

LPT (LPT/FLPY# = high)				Floppy (LPT/FLPY# = low)			
Pin	**Signal**	**Pin**	**Signal**	**Pin**	**Signal**	**Pin**	**Signal**
1	GND	2	GND	51	**LPT/FLPY#**	52	RESERVED
3	R	4	B	53	VCC	54	GND
5	HSY	6	G	55	RESERVED	56	DENSEL
7	VSY	8	DDCK	57	RESERVED	58	RESERVED
9	DETECT#	10	DDDA	59	IRRX	60	HDSEL#
11	B4	12	SHFCLK	61	IRTX	62	RESERVED
13	B5	14	EN	63	RXD2	64	DIR#
15	GND	16	GND	65	GND	66	GND
17	B1	18	B3	67	RTS2#	68	RESERVED
19	B0	20	B2	69	DTR2#	70	STEP#
21	GND	22	GND	71	DCD2#	72	DSKCHG#
23	G2	24	G5	73	DSR2#	74	RDATA#
25	G3	26	G4	75	CTS2#	76	WP#
27	GND	28	GND	77	TXD2	78	TRK0#
29	R4	30	G1	79	RI2#	80	INDEX#
31	R5	32	G0	81	VCC	82	VCC
33	GND	34	GND	83	RXD1	84	DRV
35	R1	36	R3	85	RTS1#	86	MOT
37	R0	38	R2	87	DTR1#	88	WDATA#
39	VCC	40	VCC	89	DCD1#	90	WGATE#
41	JILI_DAT	42	VSYNC	91	DSR1#	92	MSCLK
43	JILI_CLK	44	BLON#	93	CTS1#	94	MSDAT
45	HSYNC	46	DIGON	95	TXD1	96	KBCLK
47	COMP	48	Y	97	RI1#	98	KBDAT
49	SYNC	50	C	99	GND	100	GND

3.5 Connector X4 (EIDE, Ethernet, Speaker, Batterie, I2C, SMBus, etc.)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	GND	51	SIDE_IOW#	52	PIDE_IOR#
3	5V_SB	4	PWGIN	53	SIDE_DRQ	54	PIDE_IOW#
5	PS_ON	6	SPEAKER	55	SIDE_D15	56	PIDE_DRQ
7	PWRBTN#	8	BATT	57	SIDE_D0	58	PIDE_D15
9	KBINH	10	LILED	59	SIDE_D14	60	PIDE_D0
11	RSMRST#	12	ACTLED	61	SIDE_D1	62	PIDE_D14
13	ROMKBCS#	14	SPEEDLED	63	SIDE_D13	64	PIDE_D1
15	EXT_PRG	16	I2CLK	65	GND	66	GND
17	VCC	18	VCC	67	SIDE_D2	68	PIDE_D13
19	OVCR#	20	GPCS#	69	SIDE_D12	70	PIDE_D2
21	EXTSMI#	22	I2DAT	71	SIDE_D3	72	PIDE_D12
23	SMBCLK	24	SMBDATA	73	SIDE_D11	74	PIDE_D3
25	SIDE_CS3#	26	SMBALRT#	75	SIDE_D4	76	PIDE_D11
27	SIDE_CS1#	28	DASP_S	77	SIDE_D10	78	PIDE_D4
29	SIDE_A2	30	PIDE_CS3#	79	SIDE_D5	80	PIDE_D10
31	SIDE_A0	32	PIDE_CS1#	81	VCC	82	VCC
33	GND	34	GND	83	SIDE_D9	84	PIDE_D5
35	PDIAG_S	36	PIDE_A2	85	SIDE_D6	86	PIDE_D9
37	SIDE_A1	38	PIDE_A0	87	SIDE_D8	88	PIDE_D6
39	SIDE_INTRQ	40	PIDE_A1	89	GPE2#	90	CBLID_P#
41	BATLOW#	42	GPE1#	91	RXD#	92	PIDE_D8
43	SIDE_AK#	44	PIDE_INTRQ	93	RXD	94	SIDE_D7
45	SIDE_RDY	46	PIDE_AK#	95	TXD#	96	PIDE_D7
47	SIDE_IOR#	48	PIDE_RDY	97	TXD	98	HDRST#
49	VCC	50	VCC	99	GND	100	GND

Signal	Description	I/O	Note
VCC	Power Supply +5VDC, 5%	I	external supply
GND	Power Ground	I	external supply
N.C.	Not connected	n.a.	Do not connect

Signal	Description of IDE signals	I/O	Note
PIDE_D0..15	Primary IDE Databus	I/O	
PIDE_A0..2	Primary IDE Addressbus	O	
PIDE_CS1#	Primary IDE chip select channel0	O	
PIDE_CS3#	Primary IDE chip select channel1	O	
PIDE_DRQ	Primary IDE dma request	I	
PIDED_AK#	Primary IDE dma acknowledge	O	
PIDE_RDY	Primary IDE ready	I	
PIDE_IOR#	Primary IDE IO read	O	
PIDE_IOW#	Primary IDE IO write	O	
PIDE_INTRQ	Primary IDE interrupt request	I	
CBLID_P#	Cable ID primary	I	
SIDE_D0..15	Secondary IDE Databus	I/O	
SIDE_A0..2	Secondary IDE Addressbus	O	
SIDE_CS1#	Secondary IDE chip select channel0	O	
SIDE_CS3#	Secondary IDE chip select channel1	O	
SIDE_DRQ	Secondary IDE dma request	I	
SIDED_AK#	Secondary IDE dma acknowledge	O	
SIDE_RDY	Secondary IDE ready	I	
SIDE_IOR#	Secondary IDE IO read	O	
SIDE_IOW#	Secondary IDE IO write	O	
SIDE_INTRQ	Secondary IDE interrupt request	I	
DASP_S	Secondary IDE Drive active	n.a.	
PDIAG_S	Secondary IDE Master/Slave negotiation	n.a.	
HDRST#	HardDrive reset	O	

Signal	Description of Ethernet signals	I/O	Note
TXD+, TXD-	Ethernet Twisted Pair transmit signal pair	O	
RXD+, RXD-	Ethernet Twisted Pair receive signal pair	I	
ACTLED	Ethernet activity LED	O	
LILED	Ethernet link LED	O	
SPEEDLED	Ethernet speed LED, ON at 100Mb/s	O	

Signal	Description of Misc. signals	I/O	Note
SPEAKER	Speaker output	O	3.3V signal level Connect the speaker between SPEAKER and VCC
BATT	Battery supply	I	
PWGIN	Power good input	I	
I2CLK	I2C Bus clock	O	
I2DAT	I2C Bus Data	I/O	
SMBCLK	SM Bus clock	O	3.3V tolerant input
SMBDAT	SM Bus Data	I/O	3.3V tolerant input
SMBALRT#	Not supported	I	
KBINH	Keyboard inhibit	n.a.	
5V_SB	Supply of internal suspend circuit	I	
PS_ON	Power Save ON	O	
PWRBTN#	Power Button	I	
OVCR#	Over current detect for USB	I	
ROMKBCS#	Do not connect	n.a.	
EXT_PRG#	Do not connect	n.a.	
GPCS#	General purpose chip select	n.a.	
GPE1#	LID input	I	
GPE2#	Ring Input	I	
BATLOW#	Battery low	I	3.3V tolerant input
EXTSMI#	External SMI	I	3.3V tolerant input
RSMRST#	Resume Reset	I	3.3V tolerant input

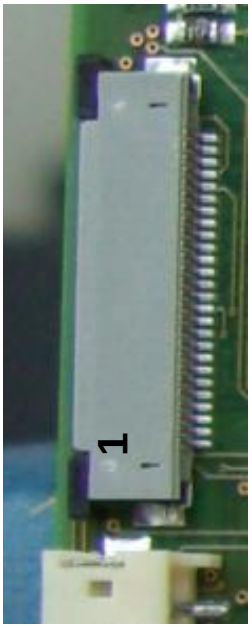
4 Other Connectors

4.1 SATA Connector X1201,X1202

Pin	Signal
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

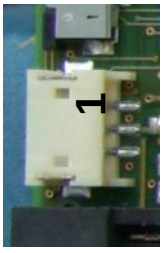
4.2 Second Display Connector J1901 (1.5V Signal Level)

Pin	Signal
1	GND
2	FPCLK
3	GND
4	FPDE
5	FPHSync
6	FPVSync
7	GND
8	FPD12
9	FPD13
10	FPD14
11	FPD15
12	FPD16
13	FPD17
14	FPD18
15	FPD19
16	FPD20
17	FPD21
18	FPD22
19	FPD23
20	GND
21	GND
22	FPSMBCLK
23	FPSMBDAT
24	SELECTSMB
25	GND
26	GND



4.3 Fan Connector X1401

Pin	Signal
1	GND
2	+5V (PWM controlled)
3	Speed



5 BIOS

5.1 Introduction

This guide describes the Phoenix FirstBIOS Pro Startup screen and contains information on how to access Phoenix FirstBIOS Pro setup to modify the settings which control Phoenix pre-OS (operating system) functions.

5.1.1 Startup Screen Overview

The Phoenix FirstBIOS Pro Startup screen is a graphical user interface (GUI) that is included in Phoenix FirstBIOS Pro products. A Startup screen consists of:

Progress Bar: Part of the Status Bar, it indicates the progress of the Startup Screen functions and provides user prompting and POST status

The following figure shows the various parts of a generic Startup Screen at 1024x768 resolution:

5.1.2 Activity Detection Background

While the FirstBIOS Startup screen is displayed, press the Setup Entry key (F2 - FirstBIOS default). The FirstBIOS Startup Status Bar acknowledges the input, and at the end of POST, the screen clears and Setup launches.

An example of the Startup Status Bar displaying changing state is shown in the following figure. The Please Wait… text is displayed after the F2 key is pressed to acknowledge user input.

Active status bar:

5.2 FirstBIOS Pro Setup Utility

With the Phoenix FirstBIOS Pro Setup program, you can modify FirstBIOS Pro settings and control the special features of your computer. The Setup program uses a number of menus for making changes and turning the special features on or off. This chapter provides an overview of the Setup utility and describes at a high-level how to use it.

5.2.1 The Main Menu

To start the Phoenix FirstBIOS Pro Setup utility, press [F2] to launch Setup. The Setup main menu displays.

The BIOS Menu Structure

The Bios menu is structured in the following way:

Main		
	IDE Channel 0 Master	
	IDE Channel 0 Slave	
	IDE Channel 1 Master	
	IDE Channel 1 Slave	
	SATA Port 0	
	SATA Port 1	
	Boot Options	
	Board Information	
Advanced		
	I/O Device Configuration	
	Advanced Chipset Control	
	VGA Control	
	Memory Cache	
	PCI Configuration	
		PCI/PNP ISA UMB Region Exclusion
		PCI/PNP ISA IRQ Resource Exclusion
	Watchdog Options	
Security		
Power		
	Hardware Monitor	
	Temperature Management	
Boot		
Exit		

The Menu Bar

The Menu Bar at the top of the window lists these selections:

Menu Items	Description
Main	Use this menu for basic system configuration.
Advanced	Use this menu to set the Advanced Features available on your system's chipset.
Security	Use this menu to set User and Supervisor Passwords and the Backup and Virus-Check reminders.
Power	Use this menu to configure Power-Management features.
Boot	Use this menu to set the boot order in which the BIOS attempts to boot to OS.
Exit	Exits the current menu.

Use the left and right arrow keys on your keyboard to make a menu selection.

The Legend Bar

Use the keys listed in the legend bar on the bottom of the screen to make your selections, or to exit the current menu. The following table describes the legend keys and their alternates:

Key	Function
F1 or Alt-H	General Help window.
Esc	Exit this menu.
Arrow keys	Select a different menu.
Up and down arrow keys	Move cursor up and down.
Tab or Shift-Tab	Move between Hour:Minute:Second and Month/Day/Year in System Time and System Date Setup node.
Home or End	Move cursor to top or bottom of window.
PgUp or PgDn	Move cursor to next or previous page.
F5 or -	Select the previous value for the field.
F6 or + or Space	Select the next value for the field.
F9	Load the Default Configuration values (for all menus).
F10	Save and exit.
Enter	Execute command or select submenu.

Select an item

To select an item, use the arrow keys to move the cursor to the field you want. Then use the plus-and-minus value keys to select a value for that field. The Save Values commands in the Exit Menu save the values currently displayed in all the menus.

Display a submenu

To display a submenu, use the arrow keys to move the cursor to the sub menu you want. Then press Enter. A pointer marks all submenus.

5.2.2 The Main Menu

You can make the following selections on the Main Menu itself. Use the sub menus for other selections.

Feature	Options	Description
System Memory	Informative	Displays amount of conventional memory detected during boot up.
Extended Memory	Informative	Displays amount of extended memory detected during boot up.
System Time	Enter Time (HH:MM:SS)	Set the System Time.
System Date	Enter Date (DD/MM/YYYY)	Set the System Date.
Legacy Diskette A	Disabled, 1.44 MB 3½“	Set the type of floppy-disk drive installed in your system.
IDE Channel 0 Master	See “Masters & Slaves”	Configure IDE Primary Master
IDE Channel 0 Slave	See “Masters & Slaves”	Configure IDE Primary Slave
IDE Channel 1 Master	See “Masters & Slaves”	Configure IDE Secondary Master
IDE Channel 1 Slave	See “Masters & Slaves”	Configure IDE Secondary Slave
SATA Port 1	See “Masters & Slaves”	Configure SATA Port 1
SATA Port 2	See “Masters & Slaves”	Configure SATA Port 2
Boot Options	Submenu	Configure Boot Options
Board Information	Submenu	Displays Hardware and BIOS specific information.

5.2.2.1 Masters & Slaves

The **Master** and **Slave** settings on the Main Menu control these types of devices:

- **Hard-disk drives**
- **Removable-disk drives**
- **CD-ROM drives**

There is one IDE connector on your motherboard, usually labeled "Primary IDE". There are usually two connectors on each ribbon cable attached to IDE connector. When you have connected two drives to this connector, the one on the end of the cable is the Master.

When you enter Setup, the Main Menu displays the results of Autotyping information each drive provides about its own size and other characteristics - and how they are arranged as Masters or Slaves on your machine.

Note: Do not attempt to change these settings unless you have an installed drive that does not autotype properly (such as an older hard-disk drive that does not support autotyping).

If you need to change your drive settings, select one of the Master or Slave drives on the Main Menu.

Note: The capacity is displayed in 'real' Mbytes (1MB=1024*1024 Bytes) Drives with a total capacity greater than 8Gbyte operate in LBA format only.

Feature	Options	Description
Type	**Auto**, None, ATAPI Removable, CD-ROM, Other ATAPI, User	**Auto** = Autotyping, the drive itself supplies the information. **None** = Autotyping is not able to supply the drive type or end user has selected None, disabling any drive that may be installed. **ATAPI Removable** = Removable Disk Drive. **CD-ROM** = CD-ROM drive. **Other ATAPI** = non-specific ATAPI Device. **User** = You supply the hard-disk drive information in the following fields.
Cylinders	1 to 65536	Number of Cylinders
Heads	1 to 16	Number of read/write heads
Sectors	1 to 63	Number of sectors per track

Feature	Options	Description
Multi-Sector Transfers	Disabled, 2 sectors, 4 sectors, 8 sectors, 16 sectors	Any selection except *Disabled* determines the number of sectors transferred per block.
LBA Mode Control	Disabled, Enabled	Enabling LBA causes Logical Block Addressing to be used in place of Cylinders, Heads, & Sectors.
32 Bit I/O	Disabled, Enabled	Enables 32-bit communication between CPU and IDE card. Requires PCI or local bus.
Transfer Mode	Standard Fast PIO 1 Fast PIO 2 Fast PIO 3 Fast PIO 4 FPIO 3 / DMA 1 FPIO 4 / DMA 2	Selects the method for transferring the data between the hard disk and system memory. The Setup menu only lists those options supported by the drive and platform.
Ultra DMA Mode	Disabled, Mode 0 Mode 1 Mode 2 Mode 3 Mode 4 Mode 5 Mode 6	Ultra DMA Mode supports 33/66/100/133 MB/sec transfer rate for fixed disk drives.
Smart Monitoring	Informative	Displays smart monitoring capability of hard disk device.

WARNING: Incorrect settings can cause your system to malfunction.

5.2.2.2 Boot Options

Feature	Options	Description
Boot-time Diagnostic Screen	Disabled, Enabled	Enabled displays the diagnostic screen during boot. *Disabled* displays the Phoenix Boot Logo.
Quick Boot Mode	Disabled, Enabled	Enabled allows POST to skip certain test while booting. This will decrease the time needed to boot the system.
FirstWare Video Mode	640x480 800x600 1024x768 1280x1024	Size of Boot Screen logo.
Summary screen	Disabled, Enabled	Enabled displays system configuration on boot.
Boot with keyboard	Disabled, Enabled	When enabled POST checks for attached keyboard and show an error message if there is no keyboard attached.
POST Errors	Disabled, Enabled	Pauses and displays SETUP entry or resume boot prompt if error occurs on boot. If disabled, system always attempts to boot.
Floppy check	Disabled, Enabled	Enabled verifies floppy type on boot. *Disabled* speeds up boot time.
Hard Disk Pre-Delay	Disabled, 3 seconds, 6 seconds, 9 seconds, 12 seconds, 15 seconds, 21 seconds, 30 seconds	Any other setting than Disabled adds a delay before the first access of a hard disk by the BIOS. Some hard disks hang if accessed before they have initialized themselves.
Extended Memory Testing	Normal, Just zero it, None	Determines which type of test will be performed on extended memory during POST (above 1 MB). Enabled quick boot will bypass normal memory test.

5.2.2.3 Board Information

Feature	Options	Description
HW Platform:	Informative	Displays the used Hardware Platform.
HW Revision:	Informative	Displays the Hardware Revision.
Bios Revision:	Informative	Displays the current Bios Revision.
Serial #:	Informative	Displays the Serial Number of the CPU Board.
Boot Counter:	Informative	Displays how many times the system was booted.
CPU String:	Informative	Displays the CPU Type.
CPU Speed:	Informative	Displays the CPU Speed.
CPU Class:	Informative	Display the CPU Class.
CPU Model:	Informative	Displays the CPU Model.
CPU Stepping:	Informative	Displays the CPU Stepping.
CPU Cores:	Informative	Displays the amount of CPU Cores.

5.2.3 The Advanced Menu

5.2.3.1 Advanced Menu Selections

You can make the following selections on the Main Menu itself. Use the sub menus for other selections.

Feature	Options	Description
Installed O/S	Other, Win95, Win98, WinMe, Win2000, WinXP	Select the operating system installed on your system which you will use most commonly. Note: An incorrect setting can cause some operating systems to display unexpected behaviour.
Reset Configuration Data	No, Yes	Selecting Yes will clear the Extended System Configuration Data (ESCD) area.
Large Disk Access Mode	Other, DOS	Select Other for UNIX, Novell NetWare. Select DOS for all other operating systems.
Small LBA-Disk CHS Translation	No, Yes	Select Yes if CHS translation should be made for an LBA-capable hard disk with less than 1024 cylinders, e.g. Compact Flash. If you have problems with booting from a Compact Flash try to change this setting.
Hide PCI/ISA bridge	Disabled, Enabled	This CPU board has two PCI/ISA bridges. The first one is the LPC bridge inside chipset and the second one an external ISA bridge. Some OS cannot handle two PCI/ISA bridges on one system. For this case the external bridge can be hidden from PCI bus. This means that the bridge works normally but does not appear as PCI device. Note: This feature can only work with a hardware revision 3.0 or higher.

Feature	Options	Description
PS/2 Mouse	Disabled, Enabled, Auto Detect	Disabled prevents any installed PS/2 from functioning, but frees up IRQ12. Enabled forces the PS/2 mouse port to be enabled regardless if a mouse is present. Auto Detect will enable the PS/2 mouse only if present.
I/O Device Configuration	Submenu	Configure Super-I/O Device
Advanced Chipset Control	Submenu	Configure Chipset Features
VGA Control	Submenu	Configure Video Device
Memory Cache	Submenu	Configure Cache Memory
PCI Configuration	Submenu	Configure PCI IRQ Control
Watchdog Options	Submenu	Configure Watchdog Device

5.2.3.2 I/O Device Configuration Menu

Feature	Options	Description
Serial Port A	Disabled, Enabled, Auto	Disabled = Disabled the device Enabled = User configuration Auto = BIOS or OS chooses configuration
Base I/O address	3F8, 2F8, 3E8, 2E8	Set the base I/O address for Serial Port A.
Interrupt	3, 4	Set the interrupt for Serial Port A.
Serial Port B	Disabled, Enabled, Auto	Disabled = Disabled the device Enabled = User configuration Auto = BIOS or OS chooses configuration
Mode	Normal, IR, ASK-IR	Set the mode for Serial Port B (wired / infrared).
Base I/O address	3F8, 2F8, 3E8, 2E8	Set the base I/O address for Serial Port B.
Interrupt	3, 4	Set the interrupt for Serial Port B.
Serial Port C	Disabled, Enabled, Auto	Disabled = Disabled the device Enabled = User configuration Auto = BIOS or OS chooses configuration Note: Serial port C is available only if a 2nd SuperIO chip is implemented on the base board. Otherwise this menu item is invisible.
Base I/O address	3E8, 2E8	Set the base I/O address for Serial Port C.
Interrupt	10, 11	Set the interrupt for Serial Port C.
Serial Port D	Disabled, Enabled, Auto	Disabled = Disabled the device Enabled = User configuration Auto = BIOS or OS chooses configuration Note: Serial port D is available only if a 2nd SuperIO chip is implemented on the base board. Otherwise this menu item is invisible.

Feature	Options	Description
Mode	Normal, IR, ASK-IR	Set the mode for Serial Port D (wired / infrared).
Base I/O address	3E8, 2E8	Set the base I/O address for Serial Port D.
Interrupt	10, 11	Set the interrupt for Serial Port D.
Floppy Controller *or* Parallel Port	Disabled, Enabled Disabled, Enabled	Disabled = Disabled the device Enabled = User configuration Note: The floppy controller shares pins with the parallel port. Therefore, depending on the status of the LPT/FLPY# signal on pin 51 of the ETX connector X3, either the floppy controller entry **or** the parallel port entry is visible.
Base I/O address	378, 278, 3BC	Set the base I/O address for Parallel Port.
Interrupt	5, 7	Set the interrupt for Parallel Port.
Mode	Output only, Bi-directional, EPP, ECP	Set the mode for Parallel Port.
DMA channel	1, 3	Set the DMA channel for Parallel Port (only available if mode was set to ECP).
External Parallel Port	Disabled, Enabled	Disabled = Disabled the device Enabled = User configuration Note: External Parallel Port is available only if a 2nd SuperIO chip is implemented on the base board. Otherwise this menu item is invisible.
Base I/O address	378, 278, 3BC	Set the base I/O address for External Parallel Port.
Interrupt	5, 7	Set the interrupt for External Parallel Port.
Mode	Output only, Bi-directional, EPP	Set the mode for External Parallel Port.

Feature	Options	Description
External Diskette Controller	Disabled, Enabled	Disabled = Disabled the device Enabled = User configuration Note: External Diskette Controller is available only if a 2nd SuperIO chip is implemented on the base board. Otherwise this menu item is invisible.

Warning: If you choose the same I/O address or Interrupt for more than one port, the menu displays an asterisk (*) at the conflicting settings. It also displays this message at the bottom of the menu:

* Indicates a DMA, Interrupt, I/O, or memory resource conflict with another device.

5.2.3.3 Advanced Chipset Control Menu

Feature	Options	Description
Legacy USB support	Disabled, Enabled	Enables support for Legacy USB.
USB port 2-3	Disabled, Enabled	Enables USB port 2-3 support. Note: USB port 0-1 are cannot be disabled.
USB 2.0 functionality	Disabled, Enabled	Enabled = USB 2.0 support, Disabled = USB 1.1 support
Parallel ATA	Disabled, Enabled	Enables parallel IDE controller.
Serial ATA	Disabled, Enabled	Enables serial IDE controller.
Native Mode Operation	Auto, Both	Enables Native IDE support. Auto: PATA = legacy (compatible) SATA = native Both: PATA = native SATA = native Note: Some OS may be not supported with native mode.
SATA Raid Enable	Disabled, Enabled	Enable SATA Raid function
OnChip Audio Device	Disabled, Enabled	Enables the onboard Audio controller.
OnChip LAN Device	Disabled, Enabled	Enables the onboard LAN controller.
LAN Boot	Disabled, Enabled	Allows network boot using the onboard LAN controller.

5.2.3.4 VGA Control

Feature	Options	Description
Frame Buffer Size	16 MB, 32 MB, 64 MB	Select the amount of main memory that the internal graphics device will use.
LCD Panel Type	640x480 18b sp 800x600 18b sp 1024x768 18b sp 1280x768 18b sp 1280x1024 24b dp 1400x1050 18b dp 1440x900 24b dp 1280x800 18b sp 1600x1200 24b dp 640x480 18b sp 1024x768 18b dp 1024x768 24b sp 1024x768 24b dp 1280x768 24b sp 1280x1024 24b dp 1400x1050 24b dp	Select the LCD panel to be used by the internal graphics. 18b = 18 bits resolution 24b = 24 bits resolution sp = one pixel per clock dp = two pixel per clock Note: EDID auto detection is not supported with this platform. Note: TTL VBIOS may have different panel types.
Display Device Selection	CRT, LCD + CRT	Select the Video Device that will be activated during POST. CRT device is always enabled.
Aperture Size	32M, 64M, 128M, 256M, 512M	Select the size of the Graphics Aperture for the video device.
OnBoard EDID/EPI EEPROM	Disabled, Enabled	Enables onboard EEPROM for EDID/EPI. Note: Not all EPI functionality is supported. Note: Before enabling please check if EEPROM is installed. Note: This feature can only work with a hardware revision 3.0 or higher. Note: EDID display detection is not supported with this chipset. Note: TTL VBIOS does not support EDID/EPI at all.

5.2.3.5 Memory Cache Control Menu

Feature	Options	Description
Cache System BIOS area	Uncached, Write Protect	Enables caching of system BIOS area.
Cache Video BIOS area	Uncached, Write Protect	Enables caching of video BIOS area.
Cache D000 – D3FF Cache D400 – D7FF Cache D800 – DBFF Cache DC00 – DFFF Cache E000 – E3FF	Disabled, Write Through, Write Protect, Write Back	Disabled = This block is not cached. Write through = Writes are cached and sent to main memory at once. Write Protect = Writes are ignored. Write Back = Writes are cached but not sent to main memory until necessary.

5.2.3.6 PCI Configuration Menu

Feature	Options	Description
PCI/PNP ISA UMB Region Exclusion	Submenu	Configure PCI/PNP ISA UMB Regions
PCI/PNP ISA IRQ Resource Exclusion	Submenu	Configure PCI/PNP ISA IRQ Resources
Shared PCI IRQs	Share One IRQ, Share Two IRQs, Share Three IRQs, Auto	Limit mapping of PCI Interrupt lines to a certain amount of IRQs. This feature can be used to reserve IRQs for non PCI devices.
PCI IRQ line 1 - 8	Disabled, Auto Select, 3, 4, 5, 7, 9, 10, 11, 12, (14, 15)	Select the IRQ number that should be used for this PCI interrupt line. Disabled – PCI INT not functional Auto Select – Let Bios decide which IRQ should be assigned 3, 4, 5, 7, 9, 10, 11, 12 – Use this IRQ number for the PCI interrupt Note: IRQ14 and IRQ15 are normally reserved for IDE and shouldn't be used for PCI IRQ line.

5.2.3.6.1 PCI/PNP ISA UMB Region Exclusion Configuration Menu

Feature	Options	Description
D000 – D3FF D400 – D7FF D800 – DBFF DC00 – DFFF	Available, Reserved	Reserve this block of upper memory for use by legacy ISA devices.

5.2.3.6.2 PCI/PNP ISA IRQ Resource Exclusion Configuration Menu

Feature	Options	Description
IRQ x	Available, Reserved	Reserve this IRQ for use by legacy ISA devices.

5.2.3.7 Watchdog Options

Feature	Options	Description
Watchdog delay	1 second, 5 seconds, 10 seconds, 30 seconds, 1 minute, 5 minutes, 10 minutes, 30 minutes	After watchdog is activated, he waits selected delay time before he starts counting the timeout period.
Watchdog timeout	0.4 second, 1 second, 5 seconds, 10 seconds, 30 seconds, 1 minute, 5 minutes, 10 minutes	Select the maximum watchdog trigger period. If the watchdog will not be triggered during selected period, system reset will be generated.
Watchdog start on boot	No, Yes	Select if the watchdog should be started at the end of POST – before OS is booted.

5.2.4 The Security Menu

Feature	Options	Description
Supervisor Password Is	Shows if supervisor password is set	
User Password Is	Shows if user password is set	
Set Supervisor Password	---	The supervisor password controls the access to the setup utility.
Set User Password	---	Sets the user password.
Password on boot	Disabled, Enabled	Enabled password entry on boot.

5.2.5 The Power Menu

5.2.5.1 Power Menu Selections

Feature	Options	Description
After Power Failure	Stay Off, Power On	Sets the mode of operation if an AC power loss occurs. Power On will turn the power on as soon as the power supply is back on. Stay Off will keep the power off until the power button is pressed.
Hardware Monitor	Submenu	See " Hardware Monitor " section.
Temperature Management	Submenu	See " Temperature Management " section.
Spread Spectrum Modulation	Disabled, 0.20%, 0.25%, 0.35%	Clock controller spread spectrum modulation reduces EMI.

5.2.5.2 Hardware Monitoring Menu

Feature	Options	Description
CPU Temp	Informative	Displays the current CPU Temperature.
Board Temp	Informative	Displays the current Board Temperature.
Vcore (CPU)	Informative	Displays the current CPU voltage.
V +2.5	Informative	Displays the current voltage.
V +3.3	Informative	Displays the current voltage.
V +1.5	Informative	Displays the current voltage.
V +1.05	Informative	Displays the current voltage.
Vbat	Informative	Displays the current Battery voltage.
CPU FAN speed	Informative	Displays the current FAN speed, only if a three wire FAN is connected to the board.

5.2.5.3 Temperature Management Menu

Feature	Options	Description
Throttling Rate	Disabled, 75%, 50%, 25%	CPU clock will be throttled by the selected value when reaching the temperature threshold. CPU or Board sensor must be enabled.
CPU Alarm Temperature	Disabled, 65°C, 70°C, 75°C, 80°C, 85°C, 90°C	If CPU temperature exceeds given value clock throttling will start.
CPU Alarm Hysteresis	3°C, 4°C, 5°C, 6°C	Alarm Temperature has to decrease by selected value to stop CPU clock throttling again.
Board Alarm Temperature	Disabled, 40°C, 45°C, 50°C, 55°C, 60°C, 65°C, 70°C	If Board temperature exceeds given value clock throttling will start.
Board Alarm Hysteresis	3°C, 4°C, 5°C, 6°C	Alarm Temperature has to decrease by selected value to stop CPU clock throttling again.

5.2.6 The Boot Menu

After you turn on your computer, it will attempt to load the operating system (such as DOS, Windows XP or Linux) from a device listed in the boot priority order. If it cannot find the operating system on that device, it will attempt to load it from the next device in that list. Boot devices (i.e., with access to an operating system) can include: hard drives, floppy drives, CD ROMs, removable devices (e.g. USB sticks), and network cards.

Note: Specifying any device as a boot device on the Boot Menu requires the availability of an operating system on that device.

Selecting "Boot" from the Menu Bar displays the Boot menu.

Feature	Description
Boot priority order: 1: USB KEY: 2: USB FDC: 3: IDE 4: 4: IDE 5: 5: IDE 0: 6: IDE 2: 7: PCI LAN: 8:	Boot priority order for next boot. System tries to boot the first bootable device in this list. Use <+> and <-> to change order. Use <x> to exclude or include device to boot priority list. Note: If the “Boot priority order“ already contains eight devices no more devices can be added. First remove one device to “Exclude from boot order” to add a new one.
Exclude from boot order: : IDE 1: : IDE 3: : USB HDD: : USB CDROM: : USB ZIP: : USB LS120: : PCI SCSI:	System does not try to boot a device from this list.

Pressing the “F10” key during the bios boot phase will bring up the bios boot menu, which will allow you to select a different boot device for the current boot process only. In this boot menu, only devices in the “Boot priority list” will selectable. Devices excluded from boot order will not be shown.

5.2.7 The Exit Menu

The following sections describe each of the options on this menu. Note that <Esc> does not exit this menu. You must select one of the items from the menu or menu bar to exit.

5.2.7.1 Exit Saving Changes

After making your selections on the Setup menus, always select "Exit Saving Changes". This procedures stores the selections displayed in the menus in CMOS (short for "battery-backed CMOS RAM") a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS.

If you attempt to exit without saving, the program asks if you want to save before exiting. During boot-up, PhoenixBIOS attempts to load the values saved in CMOS. If those values cause the system boot to fail, reboot and press <F2> to enter Setup. In Setup, you can get the Default Values (as described below) or try to change the selections that caused the boot to fail.

5.2.7.2 Exit Discarding Changes

Use this option to exit Setup without storing in CMOS any new selections you may have made. The selections previously in effect remain in effect.

5.2.7.3 Load Setup Defaults

To display the default values for all the Setup menus, select "Load Setup Defaults" from the Main Menu.

If, during boot-up, the BIOS program detects a problem in the integrity of values stored in CMOS, it displays these messages:

System CMOS checksum bad - run SETUP Press <F1> to resume, <F2> to Setup

The CMOS values have been corrupted or modified incorrectly, perhaps by an application program that changes data stored in CMOS.

Press <F1> to resume the boot or <F2> to run Setup with the ROM default values already loaded into the menus. You can make other changes before saving the values to CMOS.

5.2.7.4 Discard Changes

If, during a Setup Session, you change your mind about changes you have made and have not yet saved the values to CMOS, you can restore the values you previously saved to CMOS.

Selecting “Discard Changes” on the Exit menu updates all the selections with their previous values.

5.2.7.5 Save Changes

Selecting “Save Changes” saves all the selections without exiting Setup. You can return to the other menus if you want to review and change your selections.

5.2.8 Serial ATA Raid

To use SATA Raid functionality the “SATA Controller” and “SATA Raid” option must be enabled in BIOS SETUP. The Raid BIOS option ROM will be loaded if hard disks are connected to the SATA ports. Enter the Raid BIOS Utility by pressing the <Tab> key during Raid BIOS message is shown. Possible Raid modes are Raid 0 (Striped) or Raid 1(Mirrored).

Is a Raid set built, it will appear in the Bios Boot menu as PCI SCSI device.

Note: Changing the configuration on a built Raid set can destroy all data from the set especially from Raid 0.

If you install an OS on a Raid set, the Raid driver is needed to include during installation. On Windows 2000 or Windows XP press F6 after the Setup screen appears to load the driver from a floppy drive. To generate a driver floppy please consult the respective driver pages on our web site.

Use the Raid BIOS configuration utility to build or delete a Raid set, rebuild a mirrored set.

Use VIA V-RAID utility for further Raid configuration on Windows operating system. To download VIA V-RAID utility consult the respective driver pages on our web site.

5.2.8.1 BIOS Configuration Utility

Press the <Tab> key during Raid BIOS message is shown.

Create Array	
	Auto Setup for Data Security
	Array Mode (Raid 0, Raid 1, Raid Span)
	Select Disk Drives
	Start Create Process
Delete Array	
Create/Delete Spare	
Select Boot Array	
Serial Number View	

Leave BIOS Configuration Utility with <ESC> key.

5.2.8.2 Create a new Disc Array

- Select the create array function from the main menu
- Select array type (Raid 0, Raid1, …)
- Select the hard drives for the array
- Start the array creation process
- Confirm with <Y> key

5.2.8.3 Delete a Disk Array

- Select the delete function from the main menu
- Select the array to be deleted
- Confirm with <Y> key

5.2.8.4 Set Up a Bootable Array

- Select boot array
- Select the disk array

5.2.8.5 View Hard Drive Serial Number

- Select Serial number view

5.2.8.6 View Array Status

- Press <F1> key to show the array status

5.2.8.7 Duplicate Raid 1 Array

When booting up the system, the BIOS will detect if the RAID 1 array has any inconsistencies between source and mirror disk drives. If the BIOS detects any inconsistencies, it will prompt the user to press <Ctrl+C> to enter the critical process window. The status of the disk array will be marked as critical and the BIOS will prompt the user to duplicate the RAID 1 array to make the mirrored data consistent with the source data.

After entering the critical process window, there are two ways to duplicate the source data. The disk array can be duplicated immediately by using the Duplicating Now option. Alternatively, the disk array can be duplicated after the OS boots by choosing the Continue to boot option.

5.3 BIOS Update

If a System-BIOS update is required please follow these instructions:

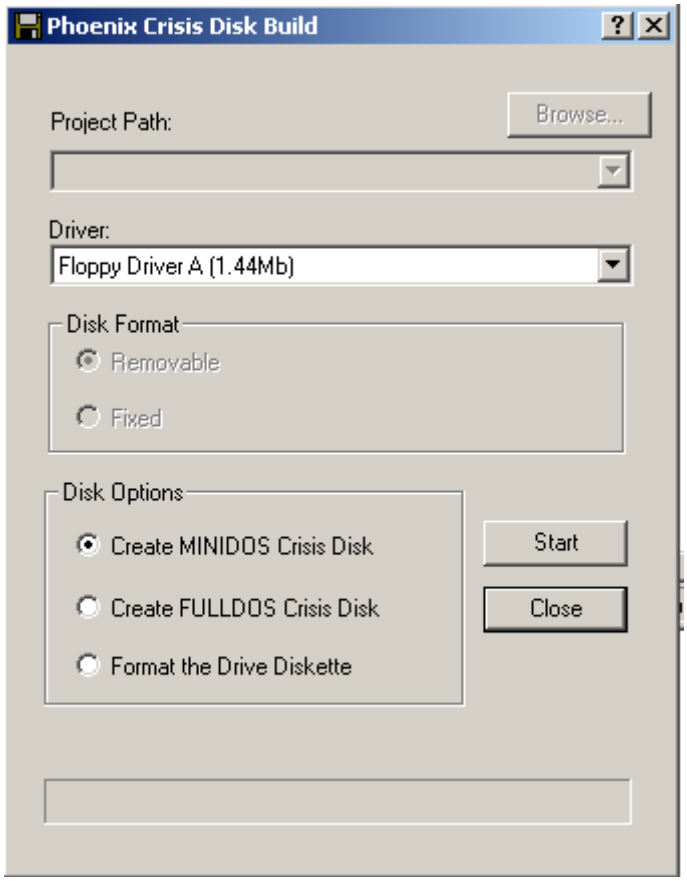
1.) Create a bootable DOS disk/usb-stick/hdd.
2.) Copy PHLASH16.EXE, BIOS.WPH and UPDATE.BAT to this device.
3.) Boot the system from this device.
4.) Type "update.bat" to update the System BIOS.
5.) When the BIOS update has finished, reboot the system.

Note: After the system has been updated, the CMOS has been changed to defaults and therefore it is necessary to enter Setup (press F2 at boot time) to configure the system settings.

5.4 Bios Crisis Recovery

Please follow these simple steps to create a bootable crisis recovery medium:

1. Unzip CRISDISK.ZIP and start the windows-based program WINCRIS.EXE on the host system. A window will pop up as shown below:



2. In the drop-down box, either select “Floppy Drive A” to create a recovery disk, or select “Removable Disk 0 (xxxMb)” to create a recovery USB stick. Disk options should be left at “Create MINIDOS Crisis Disk”.
3. Press the start button to generate the selected crisis recovery medium.

There are two possibilities to force the target system into crisis recovery mode: either by USB crisis recovery dongle or by crisis recovery jumper.

1. With the dongle, you just have to plug it into a free USB port before switching the system on. Please make sure that you use different USB controllers for USB dongle and USB crisis recovery medium. After powerup, crisis recovery should start automatically.
2. The crisis recovery jumper is located between CPU and northbridge, near the edge of the board (see picture below). You have to shorten the two pins before applying power to the board. As soon as crisis recovery is started, you can remove the jumper. The programming process is signaled by short beeps and terminated after successful programming with one long beep. After that, the system is automatically rebooted.

Important Notes:

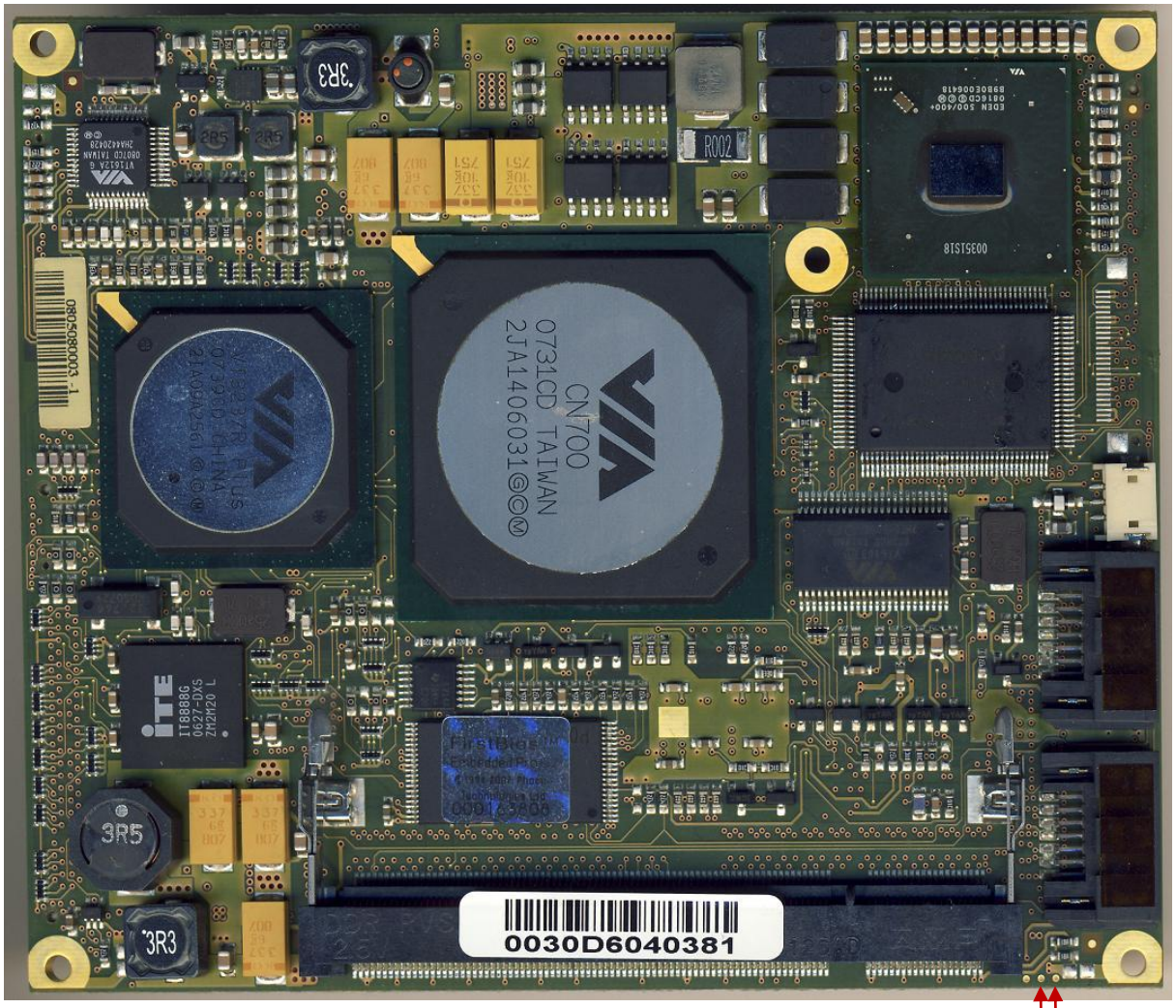
USB recovery dongle and USB crisis recovery device must not be plugged to the same USB controller.

Crisis recovery may take up to 5 minutes

A long beep indicated successful recovery

Crisis recovery does not include the bootblock.

Please contact our sales representative for how to get USB dongle or BIOS Recovery Software (CRISDISK.ZIP).



Recovery Jumper

5.5 Diagnostics Postcodes

Postcodes can be seen on a special Postcode display, either on the MSC mainboard or on an external Postcode PCI card. There is an item in the bios setup to select the bus that should get the postcode data: either PCI (for external cards) or LPC (for onboard displays).

If a postcode display has only 2 digits, only the lower byte of word-value postcodes will be shown.

5.5.1 Bootblock Bios Postcodes

Code	Bootblock Task Description
BBH	Bootblock Early Init after Reset
80h	Chipset Init
81h	Bridge Init
82h	CPU Init
83h	System Timer Init
84h	System I/O Init
85h	Check forced Recovery Boot, CMOS & CMOS Backup Clear
86h	Check BIOS Checksum
87h	Goto BIOS, start early BIOS initialzations
88h	Init Multi Processor
89h	Set Huge Segment
8Ah	OEM Initializations
8Bh	Init Interrupt and DMA Controller
8Ch	Init Memory Type
8Dh	Init Memory Size
8Eh	Shadow Boot Block
8Fh	Init SMM
90h	System Memory Test
91h	Init Interrupt Vectors
92h	Init Realtime Clock
93h	Init Standard Video
94h	Init Beeper
95h	Initialize USB Controller
95h	Init Boot
96h	Clear Huge Segment
97h	Boot OS
99h	Init Security

5.5.2 System Bios Postcodes

Code	Beeps	POST Task Description
04h		Get CPU type
03h		Disable Non-Maskable Interrupt (NMI)
06h		Initialize system hardware
07h		Disable shadow and execute code from the ROM.
08h		Initialize chipset with initial POST values
09h		Set IN POST flag
0Ah		Initialize CPU registers
0Bh		Enable CPU cache
0Ch		Initialize caches to initial POST values
0Eh		Initialize I/O component
0Fh		Initialize fixed disk drives
10h		Initialize Power Management
11h		Load alternate registers with initial POST values
12h		Restore CPU control word during warm boot
13h		Initialize PCI Bus Mastering devices
14h		Initialize keyboard controller
16h	1-2-2-3	BIOS ROM checksum
17h		Initialize cache before memory Autosize
18h		8254 timer initialization
1Ah		8237 DMA controller initialization
1Ch		Reset Programmable Interrupt Controller
20h	1-3-1-1	Test DRAM refresh
22h	1-3-1-3	Test 8742 Keyboard Controller
24h		Set ES segment register to 4 GB
28h		Autosize DRAM
29h		Initialize POST Memory Manager
2Ah		Clear 512 kB Base RAM
2Ch	1-3-4-1	RAM Address test
2Eh	1-3-4-3	Base RAM Test
2Fh		Enable cache before system BIOS shadow
32h		Compute CPU clock speed in MHz
33h		Initialize Phoenix Dispatch Manager
36h		Warm start shut down
38h		Shadow system BIOS ROM
3Ah		Autosize cache
3Ch		Advanced configuration of chipset registers
3Dh		Load alternate registers with CMOS values
41h		Initialize RomPilot
42h		Initialize interrupt vectors
45h		POST device initialization
46h	2-1-2-3	Check ROM copyright notice
47h		Initialize I20 support
48h		Check video configuration against CMOS
49h		Initialize PCI bus and devices
4Ah		Initialize all video adapters in system
4Bh		QuietBoot start (optional)
4Ch		Shadow video BIOS ROM
4Eh		Display BIOS copyright notice
4Fh		Initialize MultiBoot
50h		Display CPU type and speed
51h		Initialize EISA board
52h		Test keyboard

Code	Beeps	POST Task Description
54h		Set key click if enabled
55h		Configure USB devices
58h	2-2-3-1	Test for unexpected interrupts
59h		Initialize POST display service
5Ah		Display prompt "Press F2 to enter SETUP"
5Bh		Disable CPU cache
5Ch		Conventional memory test
60h		Extended memory test
62h		Address Test on Extended Memory
64h		Jump to UserPatch1
66h		Configure advanced cache registers
67h		CPU feature, MP, and APIC initialization
68h		Enable external and CPU caches
69h		Setup System Management Mode (SMM) area
6Ah		Display external L2 cache size
6Bh		Load custom defaults (optional)
6Ch		Display BIOS shadow status
70h		Display error messages
72h		Check for configuration errors
76h		Check for keyboard errors
7Ch		Set up hardware interrupt vectors
7Dh		Initialilze Intelligent System Monitoring
7Eh		Initialize coprocessor if present
80h		Disable onboard Super I/O ports and IRQs
81h		Late POST device initialisation
82h		Detect and install external RS232 ports
83h		Configure non-MCD IDE controllers
84h		Detect and install external parallel ports
85h		Initialize PC-compatible PnP ISA devices
86h		Re-initialize onboard I/O ports.
87h		Configure Motheboard Configurable Devices (optional)
88h		Initialize BIOS Data Area
89h		Enable Non-Maskable Interrupts (NMIs)
8Ah		Initialize Extended BIOS Data Area
8Bh		Test and initialize PS/2 mouse
8Ch		Initialize floppy controller
8Fh		Determine number of ATA drives (optional)
90h		Initialize hard-disk controllers
91h		Program timing registers according to PIO modes
92h		Jump to UserPatch2
93h		Build MPTABLE for multi-processor boards
95h		Install CD ROM for boot
96h		Clear huge ES segment register
97h		Fixup Multi Processor table
98h	1-2	Enable PCI devices and ROM Scan One long, two short beeps on checksum failure
99h		Check for SMART Drive
9Ah		Shadow option ROMs
9Ch		Set up Power Management
9Dh		Initialize security engine (optional)
9Eh		Enable hardware interrupts
9Fh		Determine number of ATA and SCSI drives
A0h		Set time of day
A2h		Check key lock
A4h		Initialize typematic rate

Code	Beeps	POST Task Description
A8h		Erase F2 prompt
AAh		Scan for F2 key stroke
ACh		Enter SETUP
AEh		Clear Boot flag
B0h		Check for errors
B1h		Inform RomPilot about the end of POST.
B2h		POST done - prepare to boot operating system
B3h		store enhanced CMOS values in non-volatile area
B4h		1 One short beep before boot
B5h		Terminate QuietBoot (optional)
B6h		Check password (optional)
B7h		Initialize ACPI BIOS
B9h		Prepare Boot
BAh		Initialize DMI parameters
BCh		Clear parity checkers
BDh		Display MultiBoot menu
BEh		Clear screen (optional)
BFh		Check virus and backup reminders
C0h		Try to boot with INT 19
C1h		Initialize POST PEM Error Manager
C2h		Initialize PEM error logging
C3h		Initialize error PEM display function
C4h		Initialize PEM system error handler
C5h		PnPnd dual CMOS (optional)
C6h		Initialize note dock (optional)
C7h		Initialize note dock late
C8h		Force check (optional)
C9h		Extended checksum (optional)
CAh		Redirect Int 15h to enable remote keyboard
CBh		Redirect Int 13h to Memory Technologies
CCh		Redirect Int 10h to enable remote serial video
CDh		Remap I/O and memory for PCMCIA
CEh		Initialize digitizer and display message
D2h		Unknown interrupt or exception